

New fluorinated surfactants for nanogels preparation

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Abstract:

A series of novel fluorinated amphiphilic stabilizers of different architecture (diblock, grafted, or palm tree copolymers) were successfully prepared by reversible addition-fragmentation chain transfer and used as stabilizers for the dispersion polymerization of 2-hydroxyethyl methacrylate (HEMA) in fluorinated solvent, namely α,α,α -trifluorotoluene (TFT). The effect of the amount and the architecture of the copolymer on the size and the stabilization of the particles was studied. Whatever the experimental conditions, scanning electron microscopy showed the formation of submicronic (typically about 300 nm) spherical particles, with a narrow size distribution (image 1). The principal difference emerges from the concentration of surfactant. Indeed, at higher copolymer concentration, smaller and less aggregated particles were produced. These results were confirmed by dynamic light scattering but these measurements also revealed the presence of larger aggregates (1,5 μm). Furthermore, the surfactant properties of the copolymers were investigated by measuring the interfacial tension at the $\text{H}_2\text{O}/\text{TFT}$ interface, and the results were correlated to their stabilizing efficiency in the dispersion polymerization of HEMA.

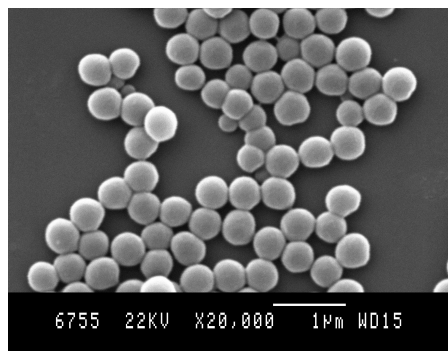


Image 1